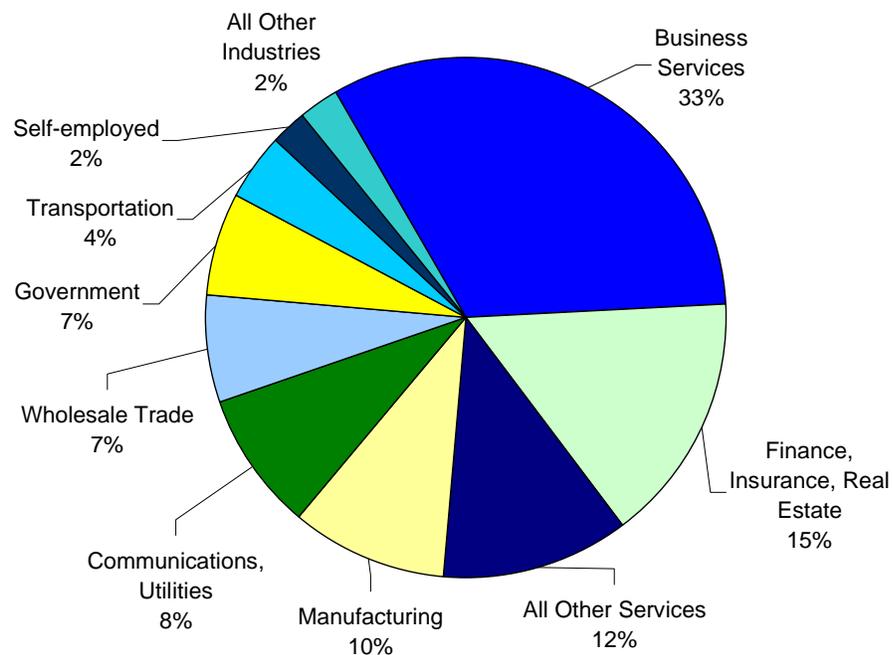


Job Description

A Computer Programmer develops and writes computer programs to store, locate, and retrieve information by converting raw data into coded computer language. A chief computer programmer plans, schedules and directs preparation of programs to process data and solves problems by use of computers. An engineering or scientific programmer converts scientific, engineering, and other technical problem formulations to a format processable by computer. A webmaster has responsibility for the overall structure, functions, security, and performance of a World Wide Web site, and may work with graphic designers to develop page layouts and graphics for the Web site. Further, a programmer may write HTML, JavaScript, or other code to create Web pages. A computer programmer, depending on their level of responsibility, can expect high levels of interaction with other staff members. Computer programmers are expected to keep up-to-date on current technologies and methods.

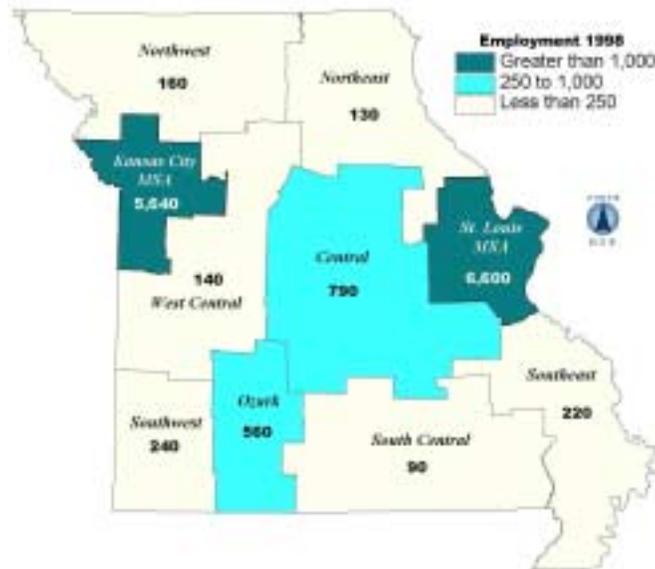
Employment by Industry for Computer Programmers



Computer Programmer Employment Trends

Region	Employment		Projected Growth	Percent Change	Average Annual Openings
	1998	2008			
United States	647,783	838,902	191,119	29.5%	--
Missouri	12,230	12,260	30	0.3	380
Northwest Region	160	150	-10	-6.3	5
Northeast Region	130	130	0	0.0	4
Kansas City MSA	5,640	5,690	50	0.9	180
West Central Region	140	120	-20	-14.3	4
Central Region	790	750	-40	-5.1	24
St. Louis MSA	6,600	6,230	-370	-5.6	205
Southwest Region	240	230	-10	-4.2	7
Ozark Region	560	580	20	3.6	19
South Central Region	90	90	0	0.0	3
Southeast Region	220	210	-10	-4.5	7

Source: MERIC. Columns are not additive due to rounding. MSAs include areas outside Missouri, and the regions are not mutually exclusive.



Computer Programmer Wage Trends

Region	Average		Range (Middle 50% of workers in occupation)
	Hourly	Annual	
United States	\$26.42	\$54,960	\$38,000-\$73,000
Missouri	\$24.82	\$51,630	\$33,000-\$70,000
Columbia MSA	\$20.90	\$43,460	\$32,000-\$53,000
Joplin MSA	\$18.73	\$38,950	\$29,000-\$46,000
Kansas City MSA	\$25.63	\$53,310	\$41,000-\$69,000
St. Joseph MSA	\$22.56	\$46,920	\$33,000-\$61,000
St. Louis MSA	\$25.54	\$53,110	\$38,000-\$72,000
Springfield MSA	\$20.64	\$42,940	\$27,000-\$56,000
Outstate Missouri	\$21.54	\$44,800	\$32,000-\$55,000

Source: MERIC, 1999 OES Survey

Typical Tasks of Computer Programmers

- ◆ Analyzes, reviews, and writes programs using work flow charts and diagrams.
- ◆ Converts detailed logical flow charts into language that can be processed by computers.
- ◆ Develops, revises, and rewrites programs according to computer storage capacity, speed, and intended use of output data.
- ◆ Consults with management, engineering, and technical staff to clarify program intent, identify problems, and suggest changes.
- ◆ Works with computer manufacturers and users to develop new programming methods.
- ◆ Helps computer operators and system analysts to resolve problems in running computer programs.

Skills Needed by Computer Programmers

- ◆ Programming: Writing computer programs for various purposes.
- ◆ Writing: Communicating effectively in writing with various audiences.
- ◆ Reading Comprehension: Understanding work related documents.
- ◆ Critical Thinking: Using logic and analysis to identify strengths and weaknesses.
- ◆ Information Organization: Finding ways to structure multiple pieces of information.
- ◆ Testing: Conducting tests to determine if equipment, software, or procedures are operating as expected.
- ◆ Problem Identification and Correction: Identifying and fixing problems.
- ◆ Active Learning: Working with new material or information to grasp its implications.
- ◆ Active Listening: Listening to others and asking appropriate questions.

Required Education and Training for Computer Programmers

Bachelor's degrees are now commonly required, although some programmers may qualify for certain jobs with 2-year degrees or certificates. College graduates who are interested in changing careers or developing an area of expertise also may return to a 2-year community college or technical school for additional training. In the absence of a degree, substantial specialized experience or expertise may be needed. Even with a degree, employers are placing more emphasis on previous experience for all types of programmers.

Job Outlook for Computer Programmers

Nationally, employment of programmers is expected to grow faster than the average for all occupations through 2008. Jobs for both systems and applications programmers should be plentiful in data processing service firms, software houses, and computer consulting businesses. These types of establishments are part of computer and data processing services, which is projected to be the fastest growing industry in the economy. As organizations attempt to control costs and keep up with changing technology, they will maintain a need for programmers to assist in conversions to new computer languages and systems. In addition, numerous job openings will result from the need to replace programmers who leave the labor force or transfer to other occupations such as manager or systems analyst.

Despite numerous openings, a number of factors will continue to moderate employment growth. The consolidation and centralization of systems and applications, developments in packaged software, advanced programming languages and tools, and the growing ability of users to design, write, and implement more of their own programs means more of the programming functions can be transferred to other types of workers. And, as the level of technological innovation and sophistication increases, programmers should continue to face increasing competition from programming businesses overseas where much routine work can be outsourced at a lower cost.

Nevertheless, employers will continue to need programmers with strong technical skills who understand an employer's business and its programming needs. Given the importance of networking and the expansion of client/server environments, organizations will look for programmers who can support data communications and help implement electronic commerce, internet, and intranet strategies. Demand for programmers with strong object-oriented programming capabilities and technical specialization in areas such as client/server programming, multimedia technology, and graphic user interface (GUI), should arise from the expansion of intranets, extranets, and World Wide Web applications. Programmers will also be needed to create and maintain expert systems and embed these technologies in more and more products.

For More Information

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*Other Sources: United States Bureau of Labor Statistics, Missouri CHOICES, O*Net (<http://online.onetcenter.org/>).*

